

Research, Engineering and Development Advisory Committee (REDAC) | MINUTES

**Meeting date** | **time** 9/18/2013 8:30 am | **Meeting location** FAA, 800 Independence Avenue, SW. Washington, DC

Purpose	REDAC Recommendations on the FY 2016 Research and Development Budget
Facilitator	Dennis Filler, REDAC Executive Director
Note taker	Aisha Staples

**Presentation** *Comments from the Administrator* | **Presenter** *Hon. Michael Huerta*

Hon. Michael Huerta greeted the Committee and thanked them for their persistence and support this year with working through challenges at FAA and NASA. He mentioned the insight obtained and application of information in the tragic airline crash at San Francisco International Airport in July 2013. The high survival rate speaks to the long-term benefits of years of research.

Fiscal Challenges of Federal Government - Hon. Huerta briefly touched on the fiscal challenges of the Federal Government and the uncertainties of fiscal year 2014. He highlighted the following important points:

- The President put forth a balanced proposal to address the long-term deficit issue, while addressing the short-term operational safety requirements of the Agency and long-term investments that need to be made in research and new technology across the National Airspace System.
- Neither the House or the Senate proposals made it to the floor. He stated that the House was focused on protecting the short-term at the expense of long-term. The Senate had a more balanced approach overall but neither body was able to reach a consensus and this is impacting the Agency's ability to make long-term investments and personnel decisions.
- He's been spending a lot of time with congressional members and their staff in both the House and Senate in an effort to (1) illustrate the importance of resolving issues for the long run and (2) to make clear that doing nothing is a worse circumstance for the Agency. The uncertainty of funding is a concern; it limits the Agency's planning and ability to be proactive; short-term resolution hurts the Agency more than long-term. He concluded that the most likely outcome would be a continuing resolution (CR) that would go through December at the FY 2012 level.

Research Priorities for FAA - Hon. Huerta also discussed research priorities that were identified in the President's budget and reviewed the Agency's requests and focuses:

- The President stated that the Agency must (1) continue to focus on the long-term infrastructure needs across the transportation sector and stay the course; (2) continue NextGen research which will set up aviation and long-term investments in the future; and (3) continue to focus on the operational side.
- The requested RE&D budget includes \$7.5M to focus on Unmanned Aircraft – planning for integration into the National Airspace System, training for Unmanned Aircraft users,

and how to accommodate various types of users. The FAA also received congressional direction to designate and begin operation of six UAS test sites.

- There requested RE&D budget includes for \$5.6M for the Alternative Fuels for General Aviation Program that will be evaluating unleaded fuels developed by industries that can be appropriately distributed throughout the aviation industry.

Transition of the Precision Departure Release Capability (PDR) - Hon. Huerta highlighted the recent transition of the Precision Departure Release Capability (PDR) from NASA to the FAA; it will help controllers better predict what time an aircraft needs to depart from the gate.

The floor was opened for questions.

Question: Is there anything the REDAC can do to be helpful with NextGen?

In response, Hon. Huerta stated that the aviation industry is undergoing some major changes, for example, adapting to higher fuel costs, identifying greater efficiencies, and technological and workforce transformation. Within these are opportunities to improve as a whole. The FAA's long-term goals are still in place; we will continue planning research, seeking recommendations, and vying for a comprehensive, strategic voice for the aviation industry to tell the larger story. In the FAA, the research needs are usually defined as a series of distinct programs. The FAA needs to develop a holistic view of what the gaps are in aviation and begin to put measures in place to balance the short and long-term aviation goals. For the FAA to create an understanding of how the different areas of research fit together, the agency needs to be on one accord, one voice. The REDAC's efforts contribute greatly to creating that voice.

Question: In response to concerns about increased automation in the wake of the Asiana crash, what can be done in terms of research?

There is a great concern about this issue and it has been discussed within AVS. High levels of automation are possibly causing pilots to lose basic skills – does the Agency fully understand interaction between automation systems, crew requirements, and updating training rules? This issue requires additional focus in regards to what the Agency can learn from other industries in terms of automation, technology, and the human side.

Question: What is the FAA strategically trying to do with the UAS test sites?

Hon. Huerta stated that he couldn't speak to the procurement process; however, the Agency is trying to ensure there is enough diversity within them that they are able to provide a platform for a wide variety of projects and characteristics for different geographies and users.

Dr. Hansman highlighted two requirements for test sites – (1) UAS test sites should enable the UAS industry to develop more innovative capabilities and (2) the FAA needs test sites to help identify issues in aviation that can be resolved so that the Agency can come up with clear operating rules and procedures.

- Hon. Huerta stated that research requirements began with inquiries on how to safely integrate UAS into the National Airspace System (NAS). In doing this, the Agency must be concerned with privacy, which is not within the Agency's traditional expertise. The

Agency must acknowledge concerns for privacy and how to deal with these concerns along with other objectives. The Agency is seeking assistance on correctly address these items.

- Dr. Jaiwon Shin stated that although the FAA has had some issues with privacy related to UAS operations, FAA and NASA UAS research is going well.

**Presentation Welcome | Presenters** *Dr. John Hansman and Ms. Pam Whitley*

Ms. Whitley greeted the Committee and reintroduced herself. She said Retired Major General Ed Bolton (the new Assistant Administrator for NextGen) was not able to attend this REDAC meeting; however, she assured the Committee that a meeting would be scheduled for Dr. Hansman to meet with him. She provided a brief overview of the Maj. General Bolton's professional background and expertise from the Air Force which included engineering and financial analysis. Ms. Whitley added that Maj. General Bolton would be a great asset to the FAA. Ms. Whitley also noted that Maj. General Bolton would be at the Technical Center Tuesday (his second official day on the job) to tour and learn about the Center.

Ms. Whitley mentioned that the Agency had offered incentive retirements options that some NextGen employees are considering. The NextGen organization is working closely with the Administrator and other lines of businesses (LOBs) on priorities. Advancing NextGen is one of the primary missions of the Agency and they have taken a good look at the program since Michael Whittaker joined. Ms. Whitley stated that the Committee helps with understanding how the research elements are standing in the way in terms of how the system runs and how it will be used in the future. The floor was opened for questions.

**Follow-up Questions and Concerns**

- In response to a request for more details on the retirement plans, Ms. Whitley stated that it is a voluntary program and each organization in the FAA has defined the parameters. For example, an organization may not offer the retirement option to staff who have a unique or specialized skill that is necessary for that organization. The FAA's workforce is aging and it's necessary to plan for the right skill sets for the future.
- Shifting personnel within an organization is also an option. However, for NextGen, the Agency sees a critical need for software expertise but won't be hiring a lot of programmers. The approach will be to build end-to-end software expertise to better analyze and fill requirements to evaluate the progress of the vendor as upgrades are made, and have our staff be more adaptable.
- The Agency can still attract the talent but it must position itself to compete with the salaries of software development companies. In the NextGen organization, there are 37 management positions and, of these positions, 21 could be gone in the next 5 years. The Agency must build a talent pool on all levels, especially technical leadership.

Ms. Whitley thanked the Committee for their guidance, recommendations, and assistance.

**Presentation REDAC Holistic View – Going Forward | Presenter Mr. Dennis Filler**

Mr. Dennis Filler stated that part of the challenge that the REDAC deals with is budgetary. For example, there are multiple forces acting on the NextGen budget portfolio.

Mr. Filler's first question was is the R&D investment right-sized (cost effective). The FAA has been asking questions as well as the agency's constituents regarding aviation research and whether the agency as a whole is focusing on the right research priorities. In addition, does the FAA have research priorities that yield the biggest impacts in aviation?

R&D is one of the areas that the FAA is most capable of leading internationally. Dennis indicated that the questions being posed to himself and the REDAC are issues that the various research programs are facing and he will look to the leaders in the REDAC to find solutions. He added that as an Advisory Committee, the questions being asked should seriously be considered by the REDAC members. Although he understands that the questions he will present to the group may ruffle some feathers, Dennis reiterated that those questions are representative of what the REDAC and the Subcommittees should have on their radar.

Mr. Filler stated that he doesn't know the answer to his questions but he'd like to believe the Agency is on the right path. The Agency must have a three-year advance to refocus and reprioritize. Sequestration by definition is "everything is equal." Sequestration and continuing resolutions (CR) aren't the only areas of impact; one of the biggest challenges is that the authorizers are not appropriators - authorizers may sense something is needed but appropriators are the ones who handle the money. Going across different lines of businesses isn't so simple either. The Committee discussed silo view vs. holistic view and the point of the rules of engagement. A lot of the research projects are multi-agency projects and one of the known challenges is to ensure the Agency works with sister agencies to avoid duplication of efforts.

Another concern is that of succession planning for research staff at FAA. The Agency has to have the ability to ensure the right questions are asked and answers are obtained; ability to look out across the board; member expertise needed to leverage. Is the Agency being strategic enough to forecast where the industry is going? What needs to be different? What should the Agency be doing? The FAA has a new leadership chain in place who is asking questions. Are we getting the biggest bang for the money? Are we allocating enough resources strategically to posture the workforce? Maybe the Agency isn't doing all it can but is looking at what and how to do it.

Regarding UAS, some may think there's overemphasis of discussion in what the test sites do; that legislative direction was possibly intended as an economic boost. The Agency is looking at anything that will provide specific safety; will look at the nature of R&D work performed and its benefit. Both the NextGen ConOps documents are ready for release which provides more "flesh on the bones of our activities." A lot of personnel were assigned to UAS for the six test sites; however, there's no clarity on what to do with the sites. Between the Agency, DoD, and NASA, the portfolio is robust.

The Committee needs a broader picture and mapping of what is being executed under R&D. A bigger picture needs to be painted to illustrate the concept of operations of a successful R&D program to include what's lacking and the mission needs to be shared with the Committee.

Commercial space is a growing requirement that seems to be a perfect place to operate under but not as an exception to the budget; it operates under a waiver. Lower airspace is being dominated. High visibility watches will be coming up relatively quick. The space operation is entirely different from UAS; the space is not intended to be integrated, it's completely isolated. There's no space launch group (it's a much smaller community); space operation is completely unrelated to UAS. The military is about 95% of all the UAS operations today. Suggestions regarding commercial space and operation space were welcome.

**Presentation *Big Data in the FAA* | Presenter *Mr. Natesh Manikoth***

Mr. Manikoth was introduced by Mr. Filler as this was his first time at a REDAC meeting. Mr. Manikoth stated that there have been questions regarding Big Data research initiatives and he had been asked to speak to the Committee on Big Data in the FAA. He informed the Committee that his focus was predominantly on the safety side. Referencing the past work in this area, Mr. Manikoth stated that there is large amount of data but there hasn't been a significant effort to make use of the operations portion of it. The Office of Advanced Concepts and Technology Development led by Paul Fontaine is starting to look at developing a concept of operations and architecture for data infrastructure in the NAS. A little over a decade ago, the FAA created the National Offload Program to collect air traffic data from various sites. Paul briefly described the offload program as tracking data from both the terminal and radar at the sample rate but no weather data is stored. MITRE operates the database but others are using data daily.

Dr. Hansman inquired about the plan for the data structure and how who had what access would be determined. Mr. Manikoth informed the REDAC that there is a data governance office within the ATO who has that responsibility. Additionally, he stated that the Agency is not collecting all data that it can. He urged the Committee to think about the future needs and what data might be useful for the Agency to collect.

Regarding the use of proprietary data, Mr. Manikoth said that the capability the Agency is developing will deal with propriety data in an appropriate manner; for example, there will be specific data control points for different levels of access based on who the user is.

The discussion continued on Big Data and how and where it should be collected and used. Mr. Manikoth closed the conversation by acknowledging a focus on structure and area of planning to address the other concerns raised in the discussion was needed as soon as possible. The Committee agreed to revisit the topic at the next REDAC meeting.

**Presentation *NAS Operations Subcommittee Report* | Presenter *Deborah Kirkman***

Ms. Kirkman (Acting Subcommittee Chair) noted Mr. Steve Bussolari was unable to attend the meeting; therefore she would brief the Committee. The main points from the findings and

recommendations from the NAS Operations Subcommittee – August 2013 handout were as follows:

- NextGen Wake Turbulence and NextGen – Wake Turbulence Re-Categorization
  - Excellent progress made in the NextGen Wake Turbulence and NextGen – Wake Turbulence Re-Categorization programs; real operations changes are visible with measurable and tangible results. The Committee applauds the work the FAA is doing in terms of translating research into operational improvements.
  - There may be a gap in the science of modeling; there's a sense of frustration (the last 30-40 years) that the wake modeling abilities have not substantially matured. The objective should be to develop a theory-based approach where the manufacturers could design for certain wake categories. The Subcommittee suggests the FAA work with industry partners to determine if the analytical capabilities have reached that level or is there a gap. Otherwise what should be expected from this research?
  
- Research Requirements for Aviation Weather Research Program (AWRP) and NextGen - Weather Technology in the Cockpit (WTIC)
  - Overall, the Committee is very pleased to see the AWRP initiatives move forward. The focus has been on how to understand the relational impacts, the interactions between entities, real-time automation to weather sources, operational changes, etc. The Subcommittee was very pleased to see these items move forward. They are waiting to see what comes out of this in about a year.
  - The Subcommittee had a hard time understanding the NextGen - Weather Technology in the Cockpit (WTIC) program. It was difficult to understand the size of the problem they are addressing, how much of the research is tied to it, and how much of the problem do they expect to resolve with the research. The Subcommittee recommends the FAA comes back with a research justification for the work.
  
- Tradespace Analysis of Mixed Equipage and Benefit Scenarios
  - The Subcommittee was pleased with the FAA's response to their last set of recommendations which stated that the FAA should ensure that mixed equipage challenges and trade space analyses are explicitly addressed in research plans associated with NextGen concepts being developed. The Subcommittee also suggested that the funding sources for the research should also be identified to quantify the research across appropriations (RE&D and F&E). This is an area of research that is critical to advance NextGen. Dr. Hansman stated part of the issue is that it continues to be viewed on the Con Ops level vs. the implementation level.
  
- JPDO
  - Ms. Kirkman stated that JPDO briefed the Subcommittee and JPDO is in a dire budget situation. The Subcommittee had no specific recommendations for JPDO and they recognize it's hard for them to meet their mission at the level of funding currently in place. However, the Subcommittee considers the JPDO's mission to

be very important, particularly in considering Mr. Filler's holistic view. Dr. Hansman stated that at one time JPDO was effective but now it has no power.

- Dr. Shin responded that in his observation as an active board member, FAA and NASA are the only two active members. Additionally, in the first five years, JPDO had a clear role, made an impactful contribution, and is moving out to have a direct connection with FAA.
  - Considering there is only a finding and no recommendation(s), Dr. Hansman queried the Subcommittee if this could be dropped from the letter to the Administrator. Given the fact JPDO is having difficulty in the coordination mission, he suggested they add a statement encouraging the JPDO to strengthen coordination bilaterally across participating agencies. Ms. Kirkman agreed to add that statement to the Subcommittee report.
- NextGen Implications for Commercial Space Transportation
    - Ms. Kirkman stated that the Subcommittee had made a recommendation related to Space Vehicle Operations based on a presentation they received on the Space Vehicle Operations Concept Development task. What the Subcommittee didn't see, however, was evidence that the researchers had integrated or coordinated research with any other organizations; in particular the Office of Commercial Space Safety which is conducting research funded with Operations funding. Dr. Hansman clarified that the REDAC includes, but is not limited, to RE&D.
    - Ms. Kirkman continued by addressing the Subcommittee's concerns about how the research is being coordinated within the FAA or with other agencies, such as NASA, and how it fits into NextGen.
  - Prioritization of Research across FAA Portfolios and Lines of Business
    - The Subcommittee discussed whether it makes sense to create an ad hoc group to provide advice from a holistic point of view (something for the REDAC to ponder). One idea that would help move in that direction would be to have cross fertilization of members.
    - As the FAA formulates its research goals, they should contain quantitative goals and metrics by which the progress of its R&D can be measured. If quantitative research goals have not been established, then the FAA should reorient its research program to establish these goals.
    - Mr. Filler agreed to update the Subcommittee on the FAA's progress in developing their holistic views at the next Subcommittee.

**Presentation:** *Human Factors Subcommittee Report* | **Presenter** *Dr. Amy Pritchett*

Dr. Amy Pritchett (Subcommittee Chair) greeted Committee and stated that she would speak to talking points from the slides distributed to the Committee and well as from some additional slides that she had prepared that covered in the topic areas of Decreased Resources, ATC/Tech Ops Core, and AVS Research Requirements.

Dr. Pritchett stated that the Subcommittee had a finding on their concern about some human factors research areas not being funded beyond FY 2015 presented significant risks. Dr.

Hansman suggested rewording Finding #1 to focus on what won't get done rather than on funding. Dr. Hansman also noted that in looking at the graphs, he didn't see an articulation or generalization of the implication of the funding cuts or the risk to safety if these items are not funded.

The ensuing discussion among the Committee members noted this seems to be a recurring issue for human factors researchers; they seem to struggle to adequately describe what the research activity will produce to improve safety for the community. They also seem to find it difficult to articulate the implications of not funding the research. The cuts in question for FY 2014 were not based on the priority of the research. Given that the cuts were dictated, the FAA decided to preserve the in-house staff at the expense of contract dollars. Thus, the Human Factors Division, which relies heavily on contract support, will not be able to fund the contractor support so that they can maintain the in-house staff.

Dr. Hansman suggested Dr. Pritchett remove the verbiage about funding and state that with financial pressures there has been a reallocation of funding and then state the reasons. The verbiage should state that the cuts were not due to a prioritization based on risk assessment, etc., but based on the FAA decisions to maintain the in-house staff.

There was some discussion on whether to treat human factors as a stand-alone entity or have it be integrated into each of the Subcommittees. If human factors was embedded, they would have to think about how that could affect how the Subcommittees operate and interact with each other. Human factors is integrated throughout the system, airports, pilot training, etc., so it might be beneficial to use that approach for the Subcommittees. At the same time, it is important to keep a focus on human factors and related issues to avoid dilution and perhaps be further ignored or forgotten.

The Committee agreed to table the discussion and resume presentation on the Human Factors Subcommittee Findings and Recommendations.

- Human Factors Input into ConOps
  - As Con Ops are developed, the Subcommittee recommends the development and implementation of NextGen ConOps be better integrated with human factors research findings and expertise. Specifically ensure human factors researchers are involved early in the process.
  - It may not be necessary to have this integration for every ConOps. The necessity should be reviewed on a case-by-case basis. A good Con Ops developer researches this and develops a strategy to ensure the risk mitigation and requirements are addressed.

Mr. Filler suggested a recommendation that clearly and articulately addresses the importance of human factors research in advancing safety and efficiency of the NAS and where and how it is a contributor to a successful NextGen implementation. This will help defend human factors research and budget.

- Requirements Generation and Prioritization with AVS
  - Dr. Pritchett referred to a slide comparing selected text from two AVS requirements for research on upset recovery and loss of control. Dr. Pritchett presented this information to show what requirements are submitted to the AVS process.
  - The two requirements were from different Technical Community Representative Groups (TCRGs). The one on the left was focused on developing the simulator hardware and improving dynamic models used in the simulator, while the one on the right was focused on developing training to reduce loss of control and upsets. The one on the right is a human factors research requirement, which was not funded in the year it was submitted; the one on the left is a terminal area safety requirement, which was funded in the year it was submitted.
  - Dr. Pritchett noted that there was a large amount of information in each requirement that she was not presenting. Thus it was difficult to conclude solely from her presentation why one was funded and the other not. It was suggested that whole requirement be reviewed if one wanted to determine why one was funded and the other was not.
  - The AVS prioritization process has improved tremendously over the last 10-15 years. However, there is always room for improvement and the Subcommittee recommends that AVS consider using a process improvement activity to look at such aspects as: weight of cross-cutting nature of the research; include description of previous work on which the requirement is based; and ways to reduce the burden on the requirement writers.
  - Program planning begins three years in advance due to the Federal government budget process; however, anytime between planning and execution, the process allows for changes in a number of ways. There is also a process for pop-ups that includes reallocating funds and reprioritizing requirements, within certain constraints. The Subcommittee recommended that the prioritization be re-assessed more frequently than at a 3-year interval.
- UAS
  - The Human Factors Subcommittee was not briefed on the UAS Human Factors research requirement because it was part of a solicitation being put out for bid on a contract and there were concerns about conflicts of interest with Subcommittee members. It is important to have this research requirement reviewed to look at it from all angles and the Subcommittee recommended the requirement be reviewed as soon as possible.

**Presentation** *Aircraft Safety Subcommittee Report* | **Presenter** *Joseph Del Balzo*

Mr. Del Balzo (Subcommittee Chair) began his presentation by stating that he would brief on the three recommendations they submitted at the end of his presentation. He then focused on a couple of highlights from their August meeting. Mr. Del Balzo made the following comments on the NextGen - Weather Technology in the Cockpit Program (WTIC):

- The WTIC program is composed of three components and funded at about \$7M; one component is related to general aviation safety and the other two components are related

to Part 121 and 135 requirements; the SAS did not comment on the Part 121/135 portion of the program.

- Their focus was on the general aviation safety portion; there's work that needs to be done; looking at low cost commercial-off-the-shelf alternatives.
- They did not look at whether the level of funding for the research was tied to quantifiable requirements that the NAS Ops Subcommittee was looking for.

Mr. Hickey briefly mentioned that the display of weather technology is the #3 safety issue in general aviation, behind angle-of-attack indicator and seat restraints. He added that the problem historically has been the nature of certification requirements in very discrete Part Numbers; for example, Part 25 (commercial air flights) and Part 23 (general aviation) air flights. However, even in Part 23, there were very high standards for putting equipment in the cockpit and in many ways it is prohibitive in nature to things that cannot quite meet Part 23 requirements because it cannot go into the airplane. The focus is to try to perform more of a continuum of safety, rather than discrete natures of safety. The consensus was it's better to have something that meets half the requirements than nothing at all. Dr. Hansman suggested they consider not restricting but provide guidance and processes for the gray area on the general aviation side.

Mr. Del Balzo informed the Committee that a modification will be made to page 6 of the FAA REDAC Aircraft Safety Subcommittee Meeting Report (August 2013) under the Weather Program. The modification will be made to the last sentence of the paragraph and will state, "This program including Weather Technology in the Cockpit could benefit from..." This was cited as a future action item.

Referencing the last recommendation, Mr. Del Balzo stated that Human Factors research doesn't receive enough attention, visibility, or support. He doesn't necessarily have an answer for this; however, he believes that if an open discussion is created, it will improve understanding.

Mr. Del Balzo comment on human factors research led to a suggestion that there might be value in having human factors specialists on the AVS TCRGs. Dr. Hansman stated that it would be effective; however; the human factors specialist must be competent enough not to overstate the case and data because there wouldn't be any benefit to this. It was suggested that engineers who have been trained in human factors (rather than human factors personnel) would most likely to work best. Dr. Pritchett suggested discussing the idea with Alan Jacobsen (from the Human Factors Subcommittee).

Dr. Hansman and Mr. Hickey acknowledged Mr. Del Balzo stepping down from Chair and thanked him for his fair and balanced recommendations and support as Chair of the Aircraft Safety Subcommittee.

<b>Action items</b>	<b>Person responsible</b>	<b>Deadline</b>
1. Modify verbiage in last sentence on Pg. 6 of the Subcommittee on Aircraft Safety Report	Joe Del Balzo	TBD

**Presentation** *Airports Subcommittee Report* | **Presenter** *Chris Oswald*

Mr. Chris Oswald (Subcommittee Chair) apologized for the late delivery of the Airport recommendations and noted that the Subcommittee met last week and will work on scheduling meetings a little earlier in the REDAC season. He stated that he would first report on two controversial studies that were discussed in the past:

- **Aircraft Braking Friction** - Good progress has been made. The Airports Technology Program staff is reporting in accordance with the Committee's milestones schedule requests; they are presenting data maps and seeing progress on the studies. There are some technical concerns about feasibility.
- **Heated Pavements** – The Subcommittee has reiterated the desire to see information related to concept of operations or concept of use to evaluate feasibility of implementing and using heated pavements at airports.

Mr. Oswald also reported that the development of a ConOps for both studies is in process and they are expecting a report by the Spring meeting. The scope of consideration has been greatly reduced. They were looking to situations that made sense such as cases where there was considerable geothermal energy available. The heated pavement was implemented as a larger part of the geothermal project.

Mr. Jim White stated that, if the studies indicate that the heated pavement concept only makes sense in areas of high geothermal activity, obviously they don't want to waste money or do things that don't make sense. It was known from the start that the study was high risk; however, there was enough new information that it was worth looking at. No commitments were made to go into an operational implementation without a full-cost benefits analysis. It may be useful in limited places such as high speed exits or ramps but they would not proceed if there's nothing to be gained.

Mr. Oswald stated that a recommendation was made at their last meeting regarding delaying advanced materials research. The FAA responded that they want to continue with some of this research because there were some promising technologies (additives to pavements, improved anti-freeze coatings, etc.).

Mr. Oswald stated he was surprised by the results on aircraft braking friction as he was recently critical of this project. Testing was done on wet/dry pavements, with limited data; the Subcommittee would like to see additional data. The real test will be as stated in the recommendation (noted above). The materials research hasn't presented any concrete solutions to heated pavements as of yet, however, he added that the research results have not proven to be substantial enough so the effort has to continue.

- Will they be able to take their results and convert them into something that's usable (concern about calibration)? How is it in their test plan when they go out to perform their tests - are they also taking parallel tests with standard friction measurement devices so we can see how their results correlate with other reports?

Mr. Oswald stated that he was not sure about other friction measurement devices; a related work plan would have to be reviewed to determine feasibility. It is believed that they are working more closely at a fundamental level to evaluate if a reasonable relationship can be established between tire slippage and tire failure. They are awaiting Spring results and a report following the recommendation made at the last meeting (Spring) to review if this is promising. This is a milestone to later engage with more significant recommendations.

- Research on Trapezoidal Grooves Ready to be Translated into Practice
  - This research has been completed and is showing positive results illustrating improvement in the rate at which water evaporates on the pavement.
  - Mr. Oswald reiterated the recommendation of putting this into practice as this is something airport operators could use; not a necessity but could be good as a risk mitigation measurement.
- High Strength Concrete Research
  - There is some concern that high strength concrete is slightly more brittle, causing quicker deterioration (fatigue) of pavements; in practice, it has been noted this concrete causes greater constructability, has a better quality, higher strength, and practicability.
- Greater Situational Awareness Needed Among Research Programs
  - The likely greatest priority is Airport Safety database development and management; dealing with excursions, incursions, wildlife strikes, etc.
  - Dr. Hansman commented this seems to be a good effort, but that he would have expected that ASIAs would be doing this already.
- Better Definition is Needed Regarding “Safety Mitigation Plans”
  - This was started because safety risk assessments (SRAs) have been not updated since 2000.
  - This is something that needed to be done to support airport issues; airports needed to develop their own safety databases (specific to each airport) as there is difficulty in using ASIAs.
  - We are looking at what data can be extracted from ASIAs and NTSB databases, there isn’t one single database from which all data can be extracted.
  - The Subcommittee would like clarification on the safety mitigation plans relative to airports and if it’s systemic. If there are specific recommendations for individual airports, the Subcommittee would like to see these coordinated with the airports at the onset.
  - The Subcommittee recommended establishing an informal safety group to include experts on airport safety to include pilot representation in an effort to obtain some insight and provide comments back as airports are setting up their own SMS systems and assessing risks with the existing data.
- Development and Prioritization on New Research Tasks
  - This recommendation has been gestating for a while. The Subcommittee would like the FAA to seek their advice and inputs when new research requirements are

developed. The Subcommittee would also like to be more involved in prioritizing human research tasks; they will be working with Mr. White on how to handle this recommendation.

- 40-Year Airfield Pavement Project
  - The Subcommittee would like the technology researchers working on the program to really consider the regional variations and the characteristics of data material by regions. This project consists of working on the regional pavement materials, its sub base characteristics, and impact on pavement design and life. There is substantial interest in this in the south central United States due to the reactivity of the materials in the pavements. Mr. Oswald said that the sub base and some of the materials that go into the pavement itself can cause premature degradation in a very short time frame.

Mr. White turned the Committee's attention to the Airport Cooperative Research Program (ACRP) that is funded out of AIP at \$15M annually. The ACRP oversight committee met in July and selected 25 projects that they will fund in FY 2014. The oversight committee and the FAA were pleased with the quality of the research topics submitted this year (better than previous year). There was concern last year about a noticeable drop-off in the quality of topics, so they encouraged people to submit topics that were applicable to Airports with a focus on NextGen as it related to Airports. An ad hoc working group was formed with the associations; NextGen, FAA, Environment, Planning Standards, etc. and developed five specific topics related to NextGen and how NextGen impacts Airports. All topics were approved and will be funded. He informed the REDAC that the approved list was located on the Transportation Research Board/ACRP website for review.

**Presentation:** *Environment and Energy Subcommittee Report* | **Presenter:** *Mr. Steve Alterman*

Mr. Alterman (Subcommittee Chair) began by stating that the Committee is supportive of what the office is doing; the basic priority remains the same. What is noticeable is the increased deficit on noise around airport (Noise Research Roadmap). There isn't much funding; the office is being urged to prioritize research activities to ensure the "best bang for the buck."

The office is very supportive of the Noise Research Roadmap as outlined in Recommendation #2, page 2, of the Environment and Energy Finding and Recommendations (August 2013). They urged the Agency to work to mature that roadmap as expeditiously as possible and that funding be made available to prevent delays in the program.

A brief history was given for Recommendation #1. Mr. Alterman stated that his department is uncertain if they should spend money on this research if the Agency's decision is based on the public's complaints without any reference to the data being developed. A question was raised regarding whether the FAA made flight plan permanent based on the public's complaints vs. data; an inquiry was made as to why there was so much research spent on Noise Research Roadmap if the FAA is going to release a report based on complaints; there were a number of complaints made by 10 people about former flight path which caused extreme concern. Dr. Hansman asked if the FAA's research was disseminated well enough to keep the decision makers

aware. He explained that the onus on the research development process is to 1) ensure there's enough focus to provide useful information for a decision and 2) ensure results are clear and disseminated to make informed decisions.

The office firmly believes in the environment research they've completed and funding should be made to ensure there are no delays in program; strongly believes Agency should utilize scientific research data so policy decisions can be made and implemented regarding flight paths, noise, etc. There is a concern that money is being spent to complete research but the built research data is not being used.

Dr. Hansman noted some information is vague in Environment and Energy's minutes; not sure how to approach writing a cover letter to the Administrator. Mr. Alterman stated that he is aware that the information is vague/high level and didn't think it necessary to write a 10-page detailed explanation for the purpose of this meeting. It was briefly mentioned that FAA research isn't well disseminated. Also, FAA was challenged by the U.S. Court of Appeals to accept citizen complaints as a basis to create findings. A unanimous decision was made to go forward and the Committee feels this may come back to haunt them.

Noise has changed over the years; before, larger aircrafts being operated creating more noise; today, there are lighter aircraft with less noise but running more flights which, to some, may have the same effect as years ago; still frequent noise nonetheless (issues being looked at in Noise Research Roadmap). Congress has mandated solutions.

**Presentation:** *Committee Discussion* | **Presenter:** *Committee Members*

The final discussion primarily consisted of the ASIAS database (limitations and who could access data); the importance of all the data sets to guide the research performance and activities; and the need to develop database access policies that both protect the industry as well as enable research.

A suggestion was made for a briefing related to Big Data's performance (what the analyses are and how it will be used) at the next REDAC meeting.

Follow-up Questions and Concerns

- UAS Roadmaps and Validation ConOps
  - The Committee requested that a briefing should be developed that provides insight into what the FAA is doing with the research data produced from UAS. The briefing needs to include a detailed analysis of Big Data and how UAS plans to use that information to add value. Routine briefing updates provided on UAS research will help the REDAC better understand how the data is structured in FAA knowledge repositories (databases) and allow the Committee to see how the research analysis methodologies and strategies have evolved over time.
  - ConOps are important, however, ConOps generally demonstrate the benefits of research at a very high level. ConOps are able to go to a deeper level if human factors considerations are included. This will ensure that the research yields the

desired benefits by examining those procedures in “real world” scenarios with human interaction. Validating ConOps provides a good argument for why ConOps research should not be cut when the FAA’s budget faces challenges.

- FAA Databases (ASIAS) and Access to Information
  - The FAA has several databases that house information related to aircraft safety and one of the Administrator’s initiatives is to synchronize all of the data into manageable subsets so that the data adds value to the research being performed in Aviation. The consensus was that the concern for access to and use of Big Data is bigger than ASIAS.
  - ASIAS was mentioned throughout the discussion because it is a unique knowledge repository system with several limitations. The data in ASIAS is tightly controlled due to its sensitive nature; therefore, it is very difficult for outside entities to perform external reviews to determine whether or not the research is addressing FAA’s high-risk safety concerns. Even more important is the fact that researchers cannot use ASIAS as guidance for what the scope of the critical research should be. For this reason, it was suggested that a specialized research subgroup be created to examine data across the various research areas and provide a broader application of that data.
  - In ASIAS, the data cannot be segmented and distributed in parts. This becomes a Big Data policy issue. The Committee agreed that there is a need to develop policies that control the access to all aviation data. In addition, access levels and protocols should be attached to certain data sets. The challenge will be searching the various databases to identify records that related to airport standards.

#### Recommendations for the Letter to the FAA Administrator

The group identified topics to be included in the letter to the FAA Administrator as follows:

- The need for more insight into what the FAA is doing with the research data produced from UAS.
- The need to develop a centralized database for all aviation research, with established policies on data access, securities, and protocols.
- The need for a comprehensive view of ConOps (validation) and how the research being done adds value to the FAA and general aviation.
- Schedule a meeting to discuss strategies to help develop policies and procedures for obtaining and affording access to proprietary and confidential data.

The meeting was adjourned at 4:00 pm.

REDAC Attendance List – September 18, 2013

**Members:**

Amy Pritchett	Joe Bertapelle
Chris Oswald	Joe Del Balzo
Deborah Kirkman (for Steve Bussolari)	John Hansman (Chair)
Dennis Filler (Executive Director)	Steve Alterman
Jack Blackhurst	
Jaiwon Shin	

**Other Attendees:**

Aisha Staples, JMA	Gloria Dunderman, FAA	Mohan Gupta, FAA
Aloha Ley, FAA	Hon. Michael Huerta, FAA	Nick Stoer, Stoer & Assoc.
Andrea Schandler, FAA	Jim White, FAA	Pam Whitley, FAA
Cathy Bigelow, FAA	John Hickey, FAA,	Paul Fontaine, FAA
Carl Burleson, FAA	Lee Olson, FAA	Paul Krois, FAA
Chris Seher, Applied Research	Michelle Yeh, FAA	Tom McCloy, FAA
Eric Neiderman, FAA	Mike Gallivan, FAA	Wendell Griffin, FAA